

What is claimed is:

- 1 Sub A17
2 of:
- 3 1. A method for receiving a signal, said method comprising the steps
4 of:
5 receiving an RF signal, said RF signal comprising a plurality of
6 information channel signals, wherein each of said plurality of
7 information channel signals are transmitted in one of a plurality of
8 transmission bands, and each of said plurality of information channel
9 signals is carried on one of a plurality of carrier frequencies;
10 down-converting said RF signal to form an intermediate signal,
11 wherein said intermediate signal comprises down-converted versions
12 of each of said plurality of information channel signals, and said
13 down-converted versions of each of said plurality of information
14 channel signals are within a common frequency spectrum; and
15 decoding said intermediate signal to extract data from said down-
converted versions of each of said plurality of information channel
signals.
 - 1 2. The method of claim 1, wherein said plurality of information channel
2 signals each comprises different code division multiple access data.
 - 1 3. The method of claim 2, wherein each of said plurality of information
2 channel signals comprises data spread using at least one spreading code.
 - 1 4. The method of claim 3, wherein each of said plurality of information
2 channel signals is spread by different spreading codes.
 - 1 Sub A17 5. The method of claim 1, wherein said step of down-converting
2 comprises down-converting each one of said plurality of carrier frequencies by a
3 plurality of oscillator frequencies.
 - 1 6. The method of claim 5, wherein the frequency spacing between
2 each adjacent pair of said plurality of carrier frequencies and between each
3 adjacent pair of said oscillator frequencies is substantially the same.

1 7. The method of claim 1, wherein said common frequency spectrum
2 comprises a first common frequency spectrum, and the step of decoding said
3 intermediate signal comprises the step of forming a base band signal by down-
4 converting said first common frequency spectrum to a second common frequency
5 spectrum, said second common frequency spectrum lower in frequency than said
6 first common frequency spectrum.

1 8. The method of claim 7, wherein the step of forming said base band
2 signal further comprises down-converting the intermediate signal using a first
3 oscillator signal to form a first base band component signal and a second
4 oscillator signal to form a second base band component signal, the first and
5 second oscillator signals each at a same frequency and a different phase.

1 9. The method of claim 8, wherein said first base band component
2 comprises a first folded signal and said second base band component comprises
3 a second folded signal, each folded signal having a frequency spectrum narrower
4 than said first common frequency spectrum.

1 10. The method of claim 9 further comprising the steps of:
2 sampling said first base band component to form a first digital
3 representation;
4 sampling said second base band component to form a second digital
5 representation; and
6 combining said first and said second digital representations to form
7 an unfolded signal, said unfolded signal having a frequency
8 spectrum greater than the spectrum of the first folded signal.

1 11. The method of claim 1, wherein the step of receiving an RF signal
2 comprises receiving an RF signal from a cellular radio base station.

1 12. The method of claim 1, further comprising the step of filtering said
2 intermediate signal to attenuate at least one signal outside the common frequency
3 spectrum before performing said step of down-converting.

1 13. A mobile radio telephone unit comprising:

2 an antenna configured to receive an RF signal, said RF signal
3 comprising a plurality of information channel signals, wherein each of
4 said plurality of information channel signals is transmitted in one of a
5 plurality of transmission bands, and each of said plurality of
6 information channel signals is carried on one of a plurality of carrier
7 frequencies;

8 a down-converter operatively coupled to the antenna and configured
9 to down-convert said RF signal to form an intermediate signal,
10 wherein said intermediate signal comprises down-converted versions
11 of each of said plurality of information channel signals, and said
12 down-converted versions of each of said plurality of information
13 channel signals are within a common frequency spectrum;

14 a decoder operatively coupled to the down-converter and configured
15 to decode said intermediate signal to extract data from said down-
16 converted versions of each of said plurality of information channel
17 signals.

1 14. The apparatus of claim 13, wherein each of said plurality of
2 information channel signals comprises different code division multiple access
3 data, and each of said information channel signals comprises data spread using at
4 least one spreading code.

5 15. The apparatus of claim 13, wherein said down-converter is
6 configured to down-convert each of said plurality of carrier frequencies by a
7 plurality of carrier frequencies having a lower frequency.

1 16. The apparatus of claim 13, wherein said down-converter comprises
2 an oscillator for generating an oscillator signal comprising a plurality of oscillator
3 frequencies, the frequency spacing between each adjacent pair of said plurality of
4 carrier frequencies and between each adjacent pair of said plurality of oscillator
5 frequencies being substantially the same.

1 17. The apparatus of claim 15, wherein the decoder comprises a CDMA
2 decoder configured to extract data from said down-converted version of each of
3 said plurality of information channel signals using a different despreading code.

1 18. A signal reception apparatus comprising:

2 a down-converter configured to form an intermediate signal by down-
3 converting an RF signal including a plurality of transmission bands to
4 at least one intermediate band, said at least one intermediate band
5 including at least one channel, wherein said down-converter down-
6 converts by multiplying said RF signal by at least two frequencies;
7 and

8 decoding circuitry coupled to the down-converter and configured to
9 extract data from each at least one intermediate band, wherein the
10 extracted data comprises data from each at least one channel
11 included in each at least one intermediate band.

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1 19. The apparatus of claim 18, wherein each of the at least one
2 channels of each at least one intermediate band comprises a different spread
3 spectrum signal, and wherein the decoding circuitry comprises a spread spectrum
4 decoder to extract data from the intermediate band using a spreading code
5 associated with each at least one channel of each at least one intermediate band.

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1 20. A CDMA receiver for operating in at least a first mode and a second
2 mode, said CDMA receiver comprising:

3 an initial RF stage, said initial RF stage for outputting a received RF
4 signal;

5 an oscillator, said oscillator for generating a plurality of oscillator
6 signals, each at a different frequency, when the receiver operates in
7 the first mode and generating a single oscillator signal when the
8 receiver operates in the second mode;

9 a down-converter coupled to said initial RF stage and said oscillator,
10 said down-converter for receiving said received RF signal and

11 multiplying said RF signal by said plurality of oscillator signals when
12 the receiver operates in the first mode, and multiplying said RF
13 signal by said single oscillator signal when the receiver operates in
14 the second mode, to generate an intermediate signal; and
15 a base band stage, coupled to said down-converter, said base band
16 stage for processing said intermediate signal.

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